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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/624,959	07/22/2003	Karen K. Gleason	101328-180	6293
21125	7590	07/21/2005		
NUTTER MCCLENNEN & FISH LLP			EXAMINER	
WORLD TRADE CENTER WEST			ZEMEL, IRINA SOPJIA	
155 SEAPORT BOULEVARD			ART UNIT	PAPER NUMBER
BOSTON, MA 02210-2604			1711	

DATE MAILED: 07/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/624,959	GLEASON ET AL.
	Examiner	Art Unit
	Irina S. Zemel	1711

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM  
 THE MAILING DATE OF THIS COMMUNICATION.**

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) Responsive to communication(s) filed on \_\_\_\_\_.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) Claim(s) 1-62 is/are pending in the application.  
 4a) Of the above claim(s) 47-62 is/are withdrawn from consideration.  
 5) Claim(s) 2-4, 11, 12, 27, 32-35, 39 and 46 is/are allowed.  
 6) Claim(s) 1, 5-10, 13-26, 28-31, 36-38 and 40-44 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1)  Notice of References Cited (PTO-892)  
 2)  Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3)  Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
     Paper No(s)/Mail Date \_\_\_\_\_

4)  Interview Summary (PTO-413)  
     Paper No(s)/Mail Date. \_\_\_\_\_

5)  Notice of Informal Patent Application (PTO-152)  
 6)  Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

Restriction to one of the following inventions is required under 35 U.S.C. 121:

The restriction requirement between three groups of claims stands as per reasons set forth in the office action dated 11-22-2004.

As set forth in the office action of 11-22-2004, during a telephone conversation with Ms. Miller on October 26, 2004 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-46. Affirmation of this election must be made by applicant in replying to this Office action. Claims 47-62 have been withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 22 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not

described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The claimed invention, i.e., process wherein the step of depositing material further comprises an additional steps of filling open spaced with aqueous solution is not enabled by the specification. It is not understood from the specification how depositing the material from vapor state as per claim 1 further includes the claimed filling with a solution.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 22, 25, 26, 28, 30, 31 and 38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As discussed above, it is not clear how the claimed step of how depositing the material from **vapor** state as per claim 1 further includes the claimed filling with n aqueous solution and whether filling with the solution results in depositing additional material.

The claimed limitation "low sticking coefficient" in claim 25is relative and it is not clear what coefficients falls within the claimed limitation.

Claim 26 recites "generating a neutral species", however it is unclear in what respect the species are neutral, i.e., whether the limitation "neutral" refers to its electric properties, chemical (such as acidity), or anything else.

Claims 28, 30 and 31 recites the term “further” in the claimed depositing step. It is not clear whether the claimed limitation defines an additional step (that includes further deposition of the claimed material in addition to previously deposited material), or it defined the material deposited during the deposition step.

In claims 38, the recitation of the claimed decomposition temperature of the porogen is given in respect of the temperature of curing, however, neither claim 38 or the base claim 1 require any steps of curing, thus it is not understood what temperatures are claimed.

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

- (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
- (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims are rejected under 35 U.S.C. 102(a or e) as being anticipated by WO 01/863038 to Universidad Politecnica De Valencia (hereinafter “WO ‘038”).

WO ‘038 discloses a process for fabricating a nanoporous structure comprising steps of depositing an array of porogen (silica spheres) on a substrate (such as polymethacrylate substrate), crystallizing the porogen until densely packed, depositing

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a material from vapor (such as chemical vapor deposition of di-germane) to fill the voids in the porogen structure, and decomposing the porogen. See for example, illustrative examples 1-4, and fabrication method on pages 21-22, etching on page 23, etc. The reference further discloses deposition of array of porogen by applying aqueous suspension of porogen on a surface of the substrate (example 1), gradient heating the substrate (example 5). The reference further discloses that porogen can be deposited in random or ordered array and can comprise particles of uniform size or particles of various sizes (see page 24, for example), thus fully anticipating limitations of claims 13-16. The reference also contemplates various porogen shapes such as spherical, as per claim 18. The deposition of germanium material as per examples on pages 21-23 is accomplished by CVD as per claims 19 and 20. The deposition of the porogen and the material is done under a specified flow rate which inherently allows for control of the porosity (see all illustrative examples.) The reference further expressly discloses filling the porogen structure voids with a hydride precursor of the final germanium material as per claims 23 and 24.

The invention as claimed in claims 1, 8, 9 10, 13-16, 18-21, 23, 24, 29, 32, and 42 is fully anticipated by the disclosure of the WO '038 reference.

#### ***Claim Rejections - 35 USC § 102/103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 25, 26, 36 and 38, and 40-45 are rejected under 35 U.S.C. 102(a or e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over WO '038.

The disclosure of the WP '038 reference is discussed above. The reference does not expressly address the properties of the properties of the nanoporous structure obtained by the methods taught in the reference. However, from the physical properties of the disclosed nanoporous materials and the process steps to form the structures, it is reasonable believed that the disclosed structures inherently exhibit the properties corresponding to the properties claimed in claims 25, 26, 38, and 40-45. The burden is shifted to the applicants to provide factual evidence to the contrary. Furthermore, decomposition of the prrogen over a predetermined time as disclosed in example 7 inherently establishes the decomposition rate.

#### ***Claim Rejections - 35 USC § 103***

Claims 5-7, 9and 37 rejected under 35 U.S.C. 103(a) as being unpatentable over WO '038.

The disclosure of the WP '038 reference is discussed above. The reference does not expressly address the methods of depositing of silica suspension on the substrate thus implying that any known method such as those using a syringe, spray deposition of suspension, spin coating, etc., which are notoriously known in the art would have been suitable for deposition of silica suspension to a substrate. Therefore, it is the examiner's position that methods of deposition specifically claimed in claims 5, 7 and 9 would have been obvious absent showing of unexpected results. Furthermore, it is also considered well known in the art to vary time/temperature chemical/physical

process such as etching out of porogen (as per claim 37) to vary dissolution/etching rate. Thus, inventions claimed in claims 5,-7, 9 and 38 are considered to have been obvious variants of the disclosed invention.

***Allowable Subject Matter***

Claims 2,3,4, 11, 12, 27, 28, 30-32, 33-35, 39, and 46 are considered allowable over the prior art of record since no prior art of record teaches or fairly suggests the claimed process of fabrication of nanoporous strictures in which the matrix material is deposited in **vapor** phase in conjunction with additional step limitations of claims 2,3,4, 11, 12, 27, 28, 30-32, 33-35, 39, and 46 .

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Irina S. Zemel whose telephone number is (571)272-0577. The examiner can normally be reached on Monday-Friday 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on (571)272-1078. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Irina S. Zemel  
Examiner  
Art Unit 1711

ISZ



A handwritten signature in black ink, appearing to read "Irina S. Zemel". The signature is fluid and cursive, with "Irina" and "S." being more distinct and "Zemel" being more stylized.